The SARS Experience in Ontario, Canada

Presentation to the Campbell Commission

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- *Commissioner of Public Health, Chief Medical Officer of Health and Assistant Deputy Minister*
- *Ontario Ministry of Health and Long-Term Care*

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Presentation Outline

- The spread of SARS in Ontario
- Demographics of infected patients
- Incubation period
- Hospitalization and case fatality rates
- Quarantine data
- Multi-level Response: management, infection control, communication
- Next Steps

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SARS: Evolving Knowledge

104-02005/

	Initial State	Current State
Origin	Unknown	Animal species
Symptoms	Uncertain	Well understood
Laboratory Test	Non-existent	Test only available for confirmation
Transmission	Unknown	Droplets & contacts
Protective Measures	Unknown	Well defined
Incubation Period	Unknown	About 10 days
Treatment	Unknown	Empirical
Vaccine	Unavailable	Unavailable
Long-term Effect	Unknown	Unknown

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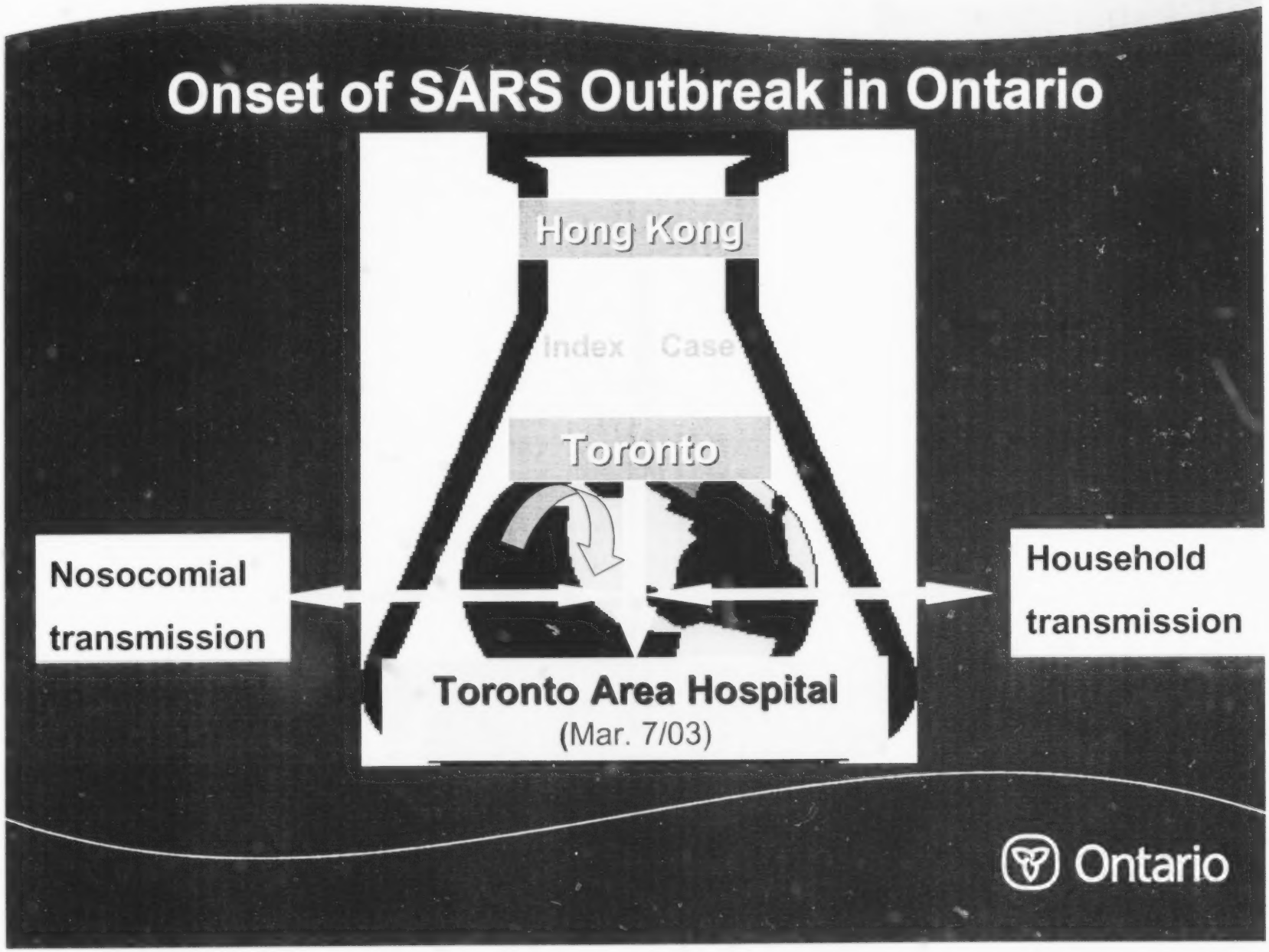
Onset of SARS Outbreak in Ontario
Hong Kong
Index Case
Toronto
Nosocomial transmission
Household transmission
Toronto Area Hospital
(Mar. 7/03)
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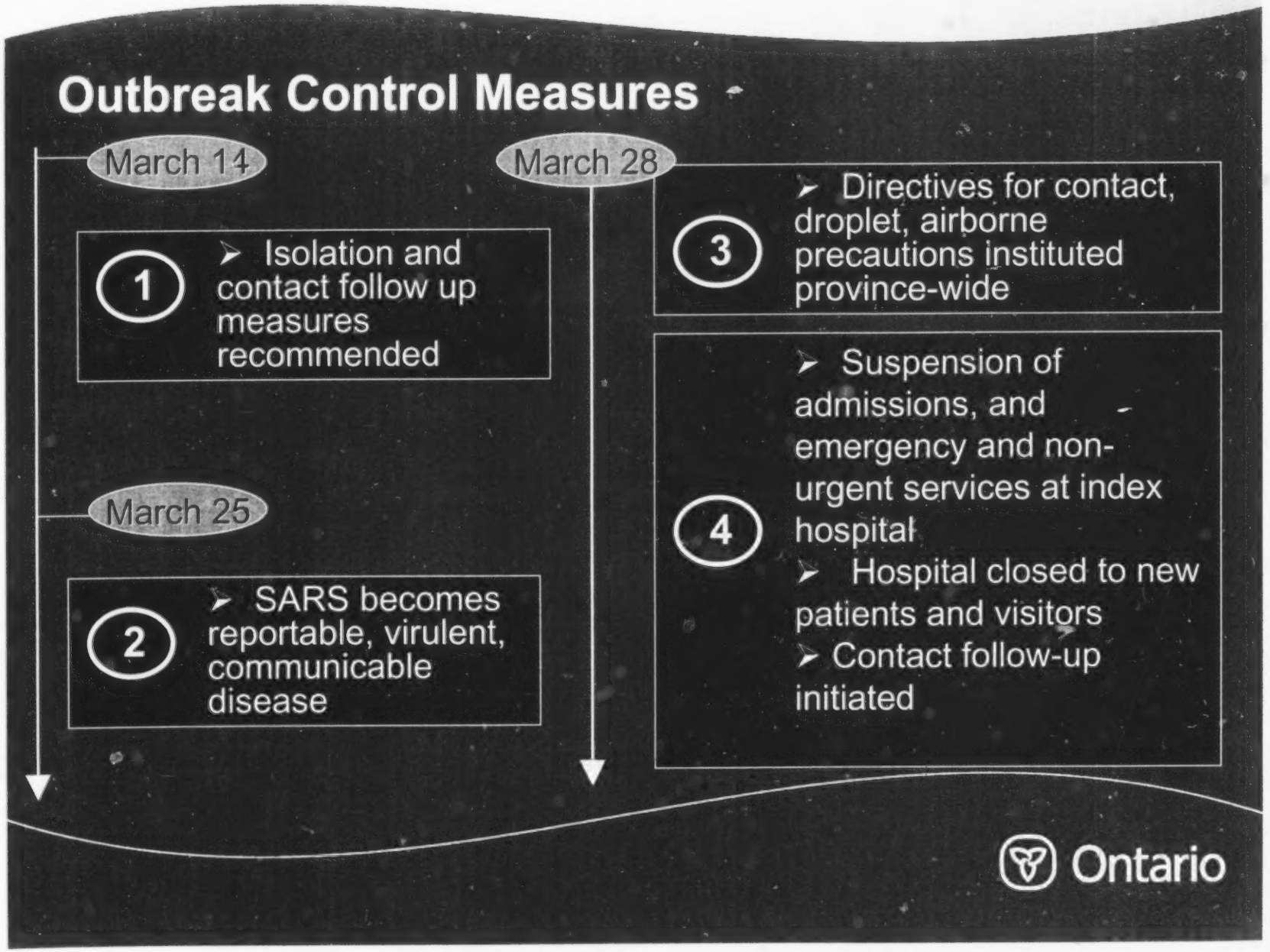
Outbreak Control Measures
March 14
1
Isolation and contact follow up measures recommended
March 25
2
SARS becomes reportable, virulent, communicable disease
March 28
3
Directives for contact, droplet, airborne precautions instituted province-wide
4
Suspension of admissions, and emergency and non-urgent services at index hospital
Hospital closed to new patients and visitors
Contact follow-up initiated
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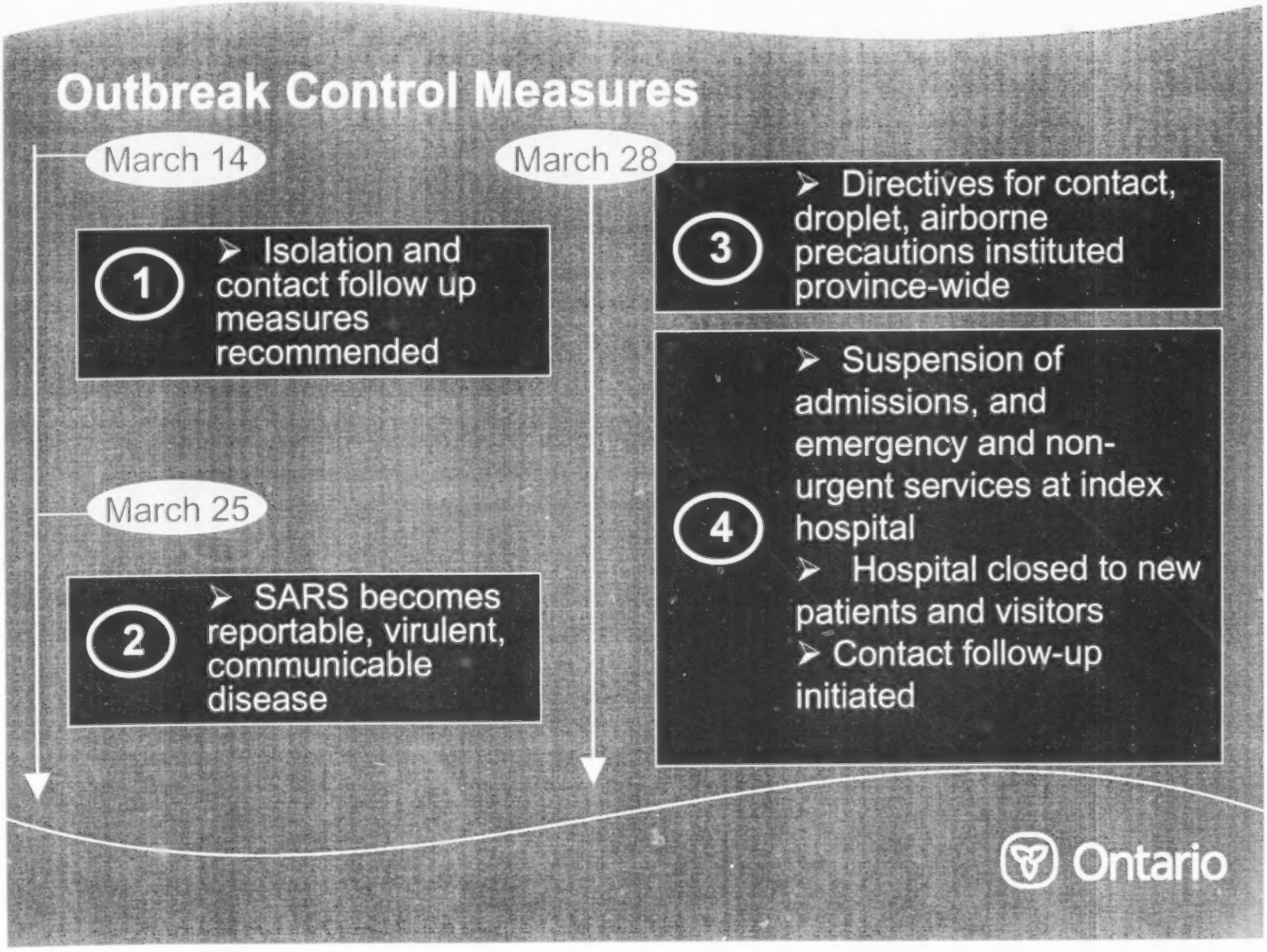
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Definition of a Probable SARS Case

A person presenting with:

- Fever (over 38^0 Celsius)
- Cough or breathing difficulty
- Radiographic evidence of infiltrates on chest x-ray*
- One or more of the following exposures during the ten days prior to the onset of symptoms:
  - Close contact with a probable or suspect case
  - Travel abroad to an area with recent SARS transmission
  - Recent travel or visit to an identified Canadian setting where SARS exposure may have occurred

* after May 29, 2003

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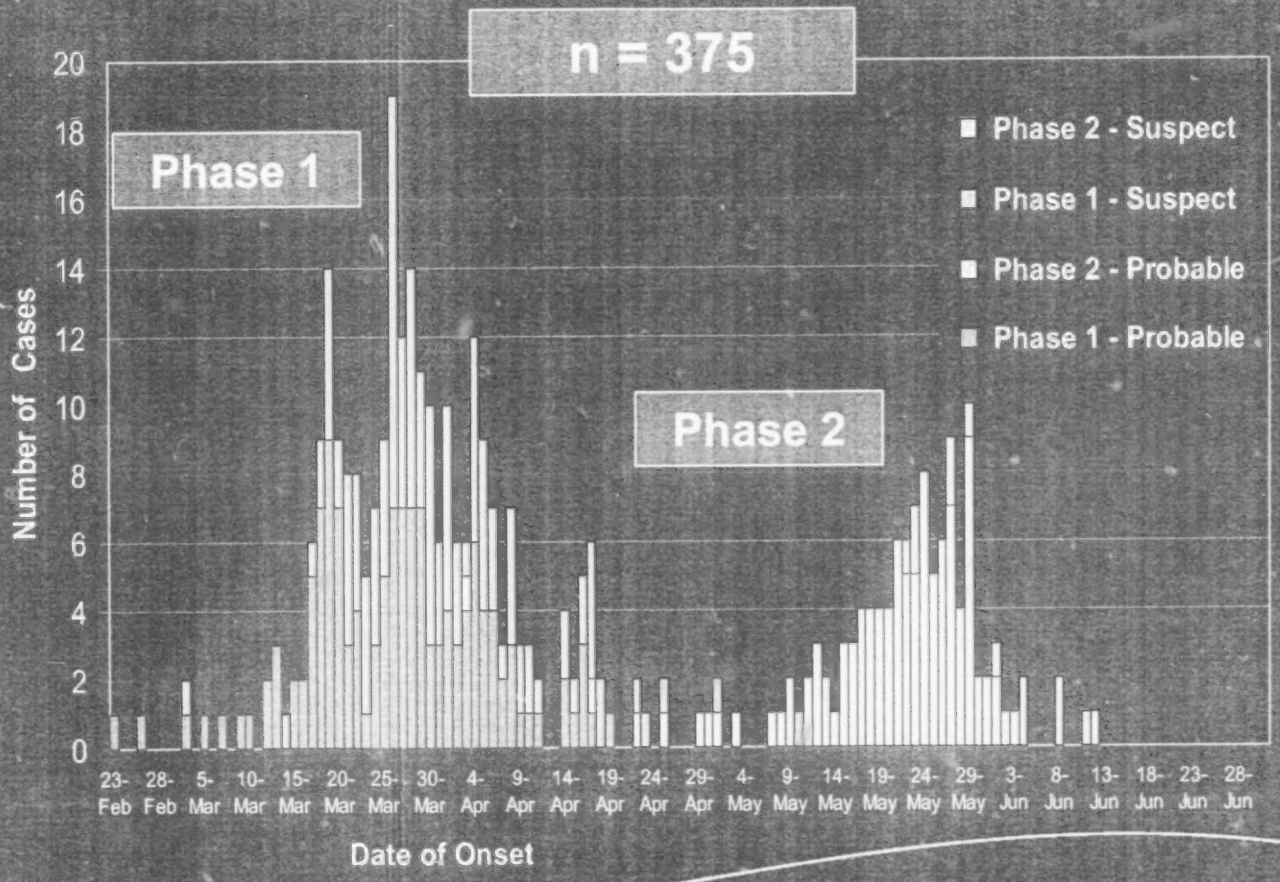
SARS Cases in Ontario by Case Status and Phase



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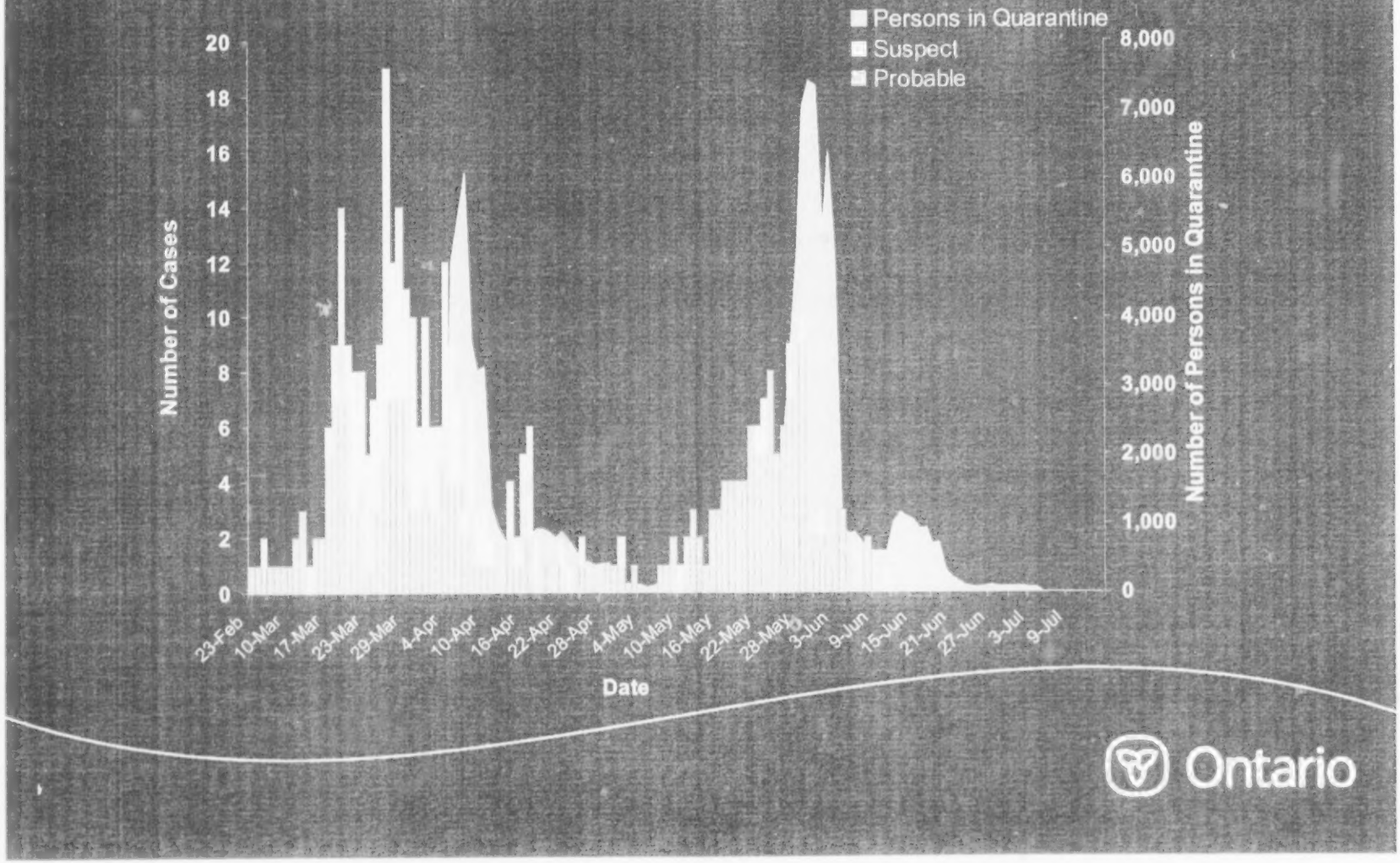
SARS Cases and Persons under Quarantine



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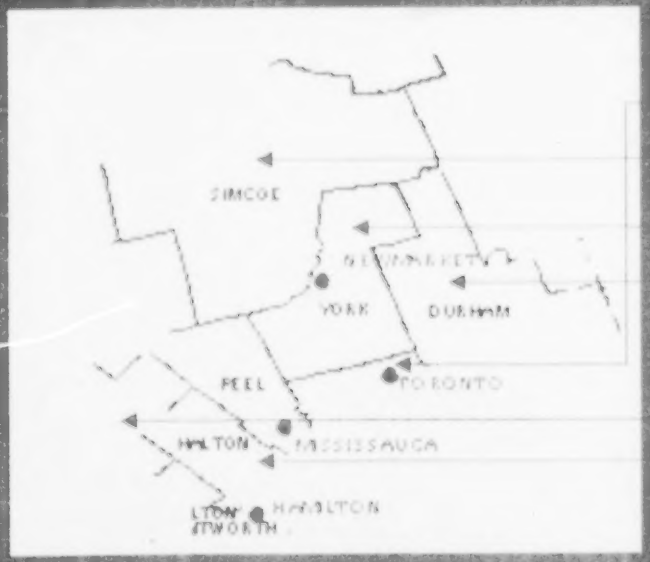
Quarantine Orders Issued During the Outbreak

Breakdown by HU and Order Type



Health Unit	S. 22	S. 35
Toronto	27	
York	20	1
Durham	11	
Wellington	4	
Simcoe	2	
Halton	1	
Total	**65**	**1**

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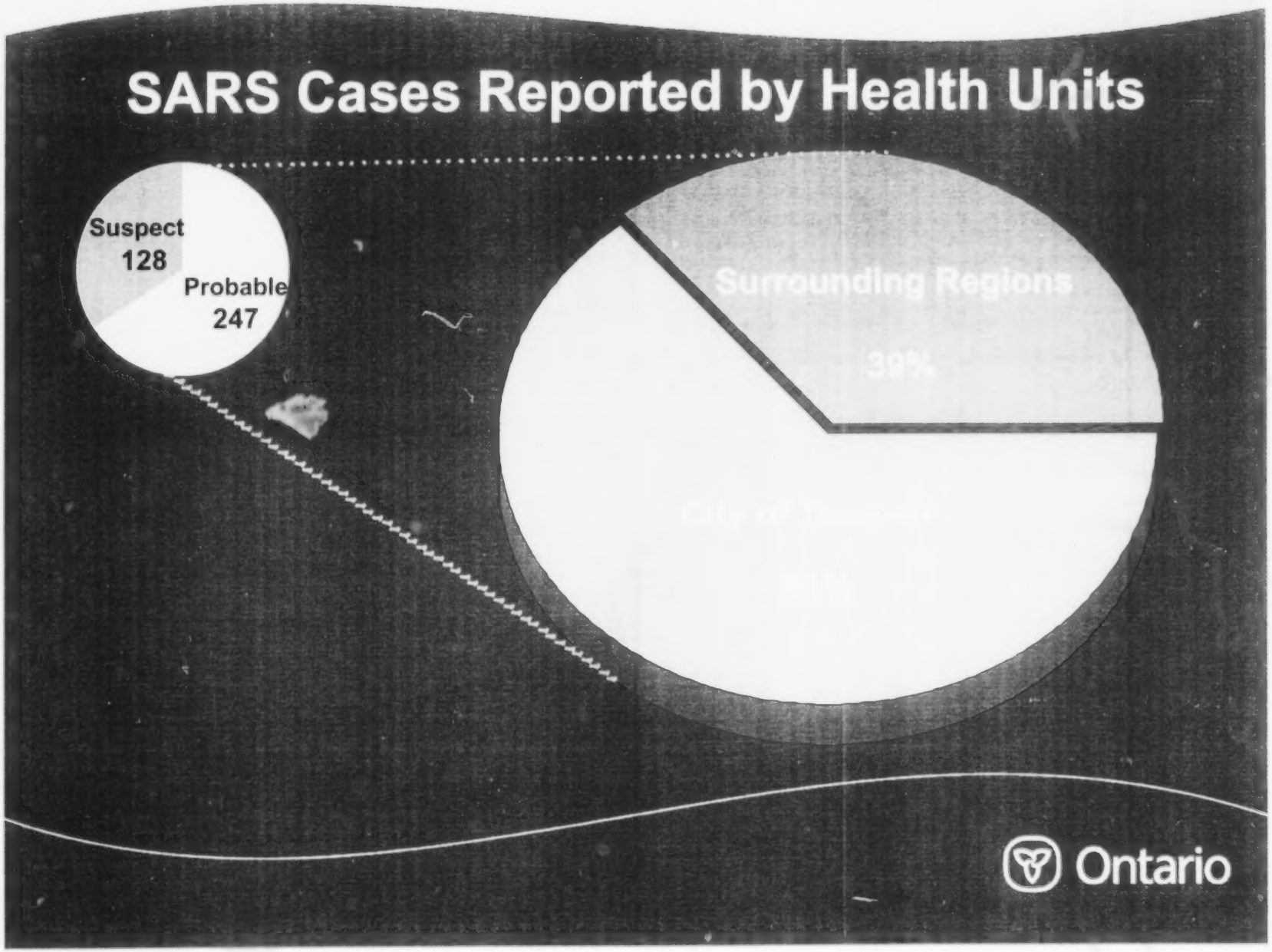
SARS Cases Reported by Health Units
Suspect
128
Probable
247
Surrounding Regions
39%
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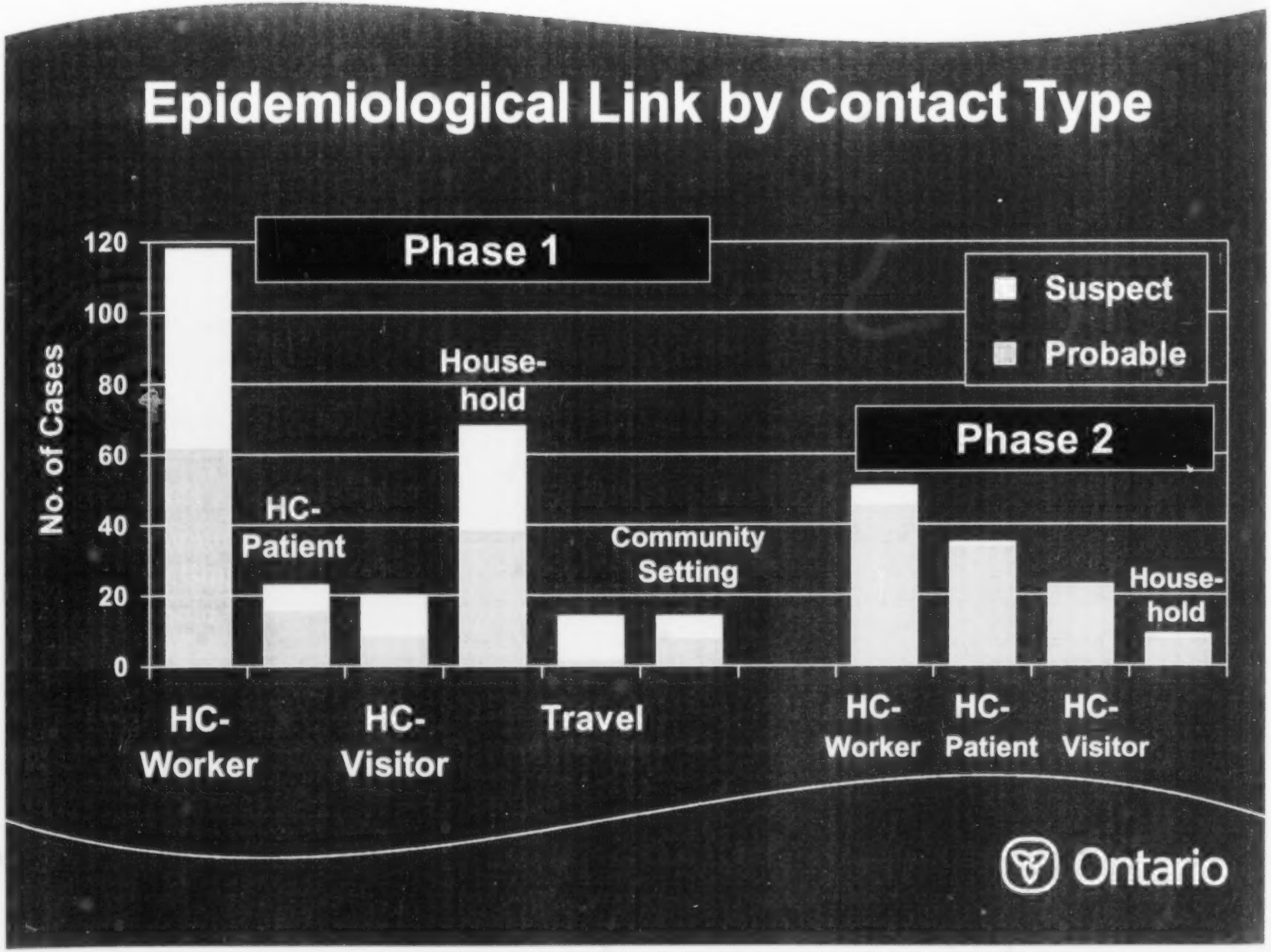
Epidemiological Link by Contact Type
Phase 1
Phase 2
Suspect
Probable
No. of Cases
120
100
80
60
40
20
0
HC-Worker
HC-Patient
HC-Visitor
House-hold
Travel
Community Setting
HC-Worker
HC-Patient
HC-Visitor
House-hold
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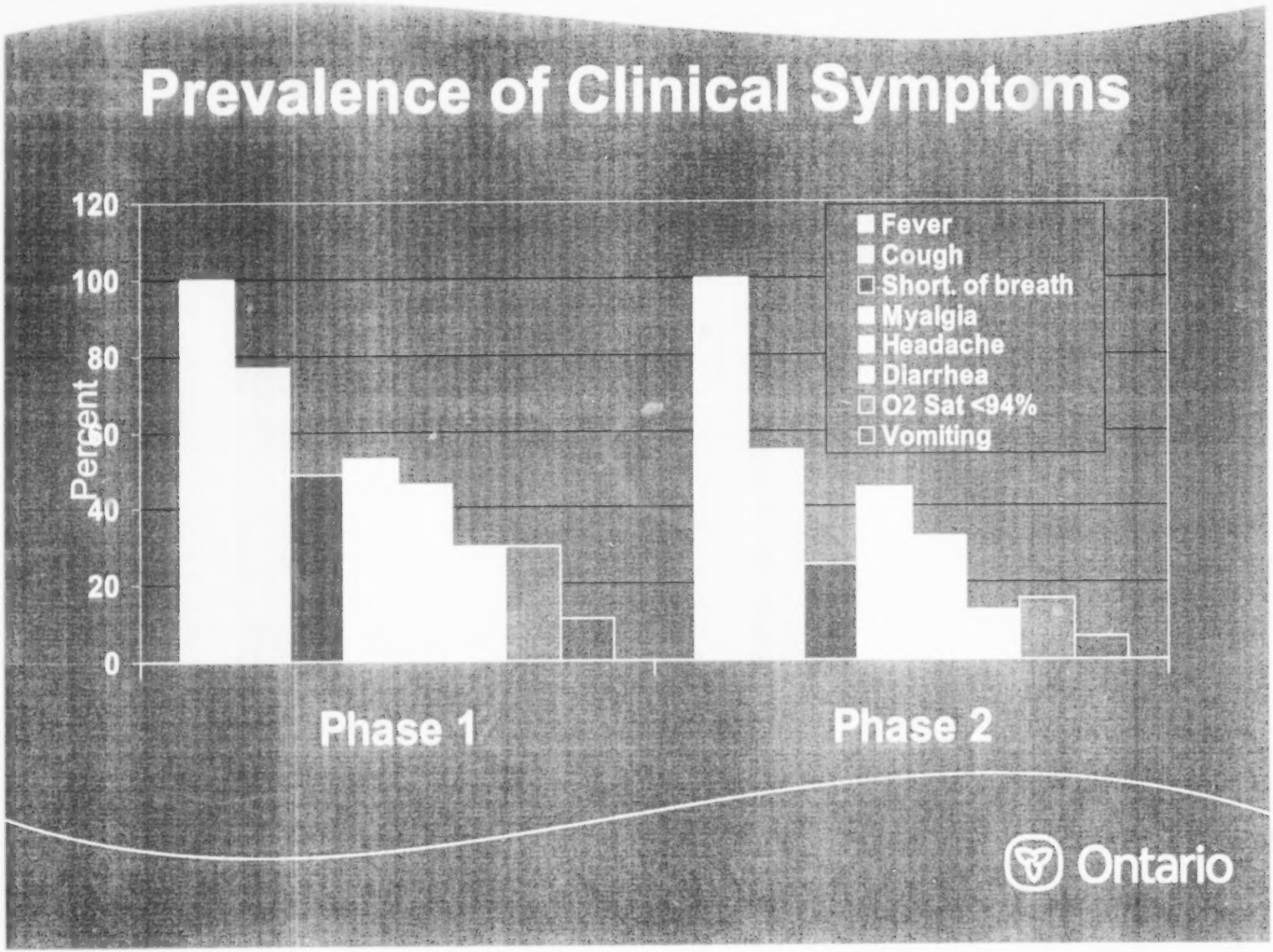
Prevalence of Clinical Symptoms
120
100
80
60
40
20
0
Percent
Fever
Cough
Short. of breath
Myalgia
Headache
Diarrhea
O2 Sat <94%
Vomiting
Phase 1
Phase 2
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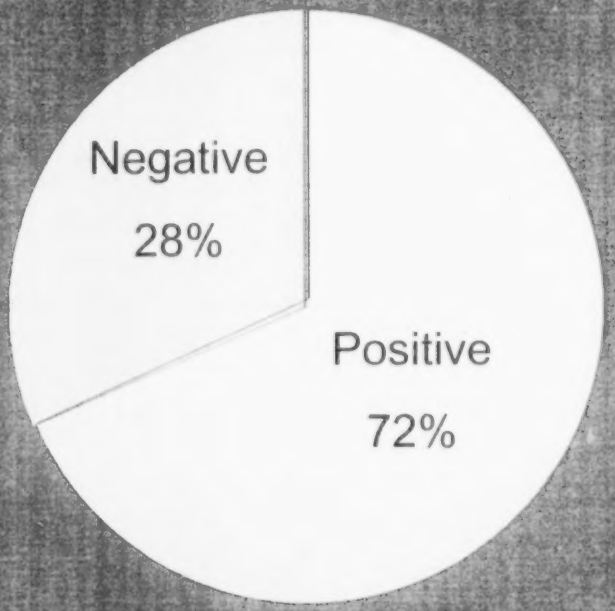
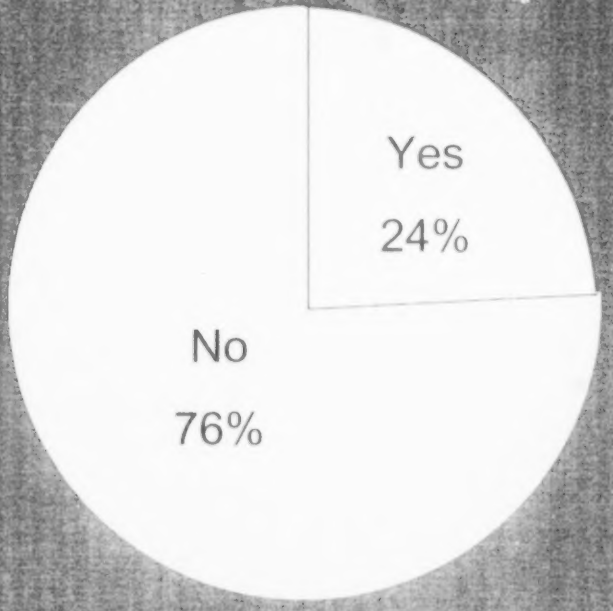
Diagnosis and Intervention

Probable and Suspect Cases



Chest X-Ray Infiltration



Patient Intubation

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Case Distribution by Sex

Probable and Suspect SARS Cases

Sex	Phase 1		Phase 2	
	N	%	N	%
Male	90	35	41	35
Female	167	65	77	65
Total	257	100	118	100

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Age Distribution of Cases by Sex

Probable and Suspect SARS Cases

Sex	Phase 1			Phase 2		
	Mean	Median	Range	Mean	Median	Range
Male	44.6	42	2-89	54.3	56	16-98
Female	43.3	42	1-99	49.5	49	11-90
Total	43.7	42	1-99	51.2	50	11-98

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Case Distribution by Age Group

Probable and Suspect SARS Cases

Age Group [years]	Phase 1		Phase 2	
	N	%	N	%
< 18	18	7	2	2
18 – 35	71	28	20	17
36 – 64	132	51	70	59
65 +	36	14	26	22
Total	257	100	118	100

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Incubation Period by Sex

Probable and Suspect

Phase	Sex	Days from Exposure to Onset	
		Mean	Median
Phase 1	Male	8.2	8
	Female	7.4	7
Phase 2	Male	7.1	6
	Female	6.3	5
Ph. 1 & 2	Both	7.1	6

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Incubation Period by Age Group

Probable and Suspect

Age Group [years]	Mean Incubation Period [Days]			
	Phase 1		Phase 2	
	Males	Females	Males	Females
< 18	14.5*	7.4	8.6	7.6
18 – 35	8.3	7.4	7.1	6.3
36 – 64	8.3	7.2	6.8	6.0
65 +	7.6	8.5	9.3	8.1
All	8.2	7.4	7.1	6.3

* Sample size consists of two cases

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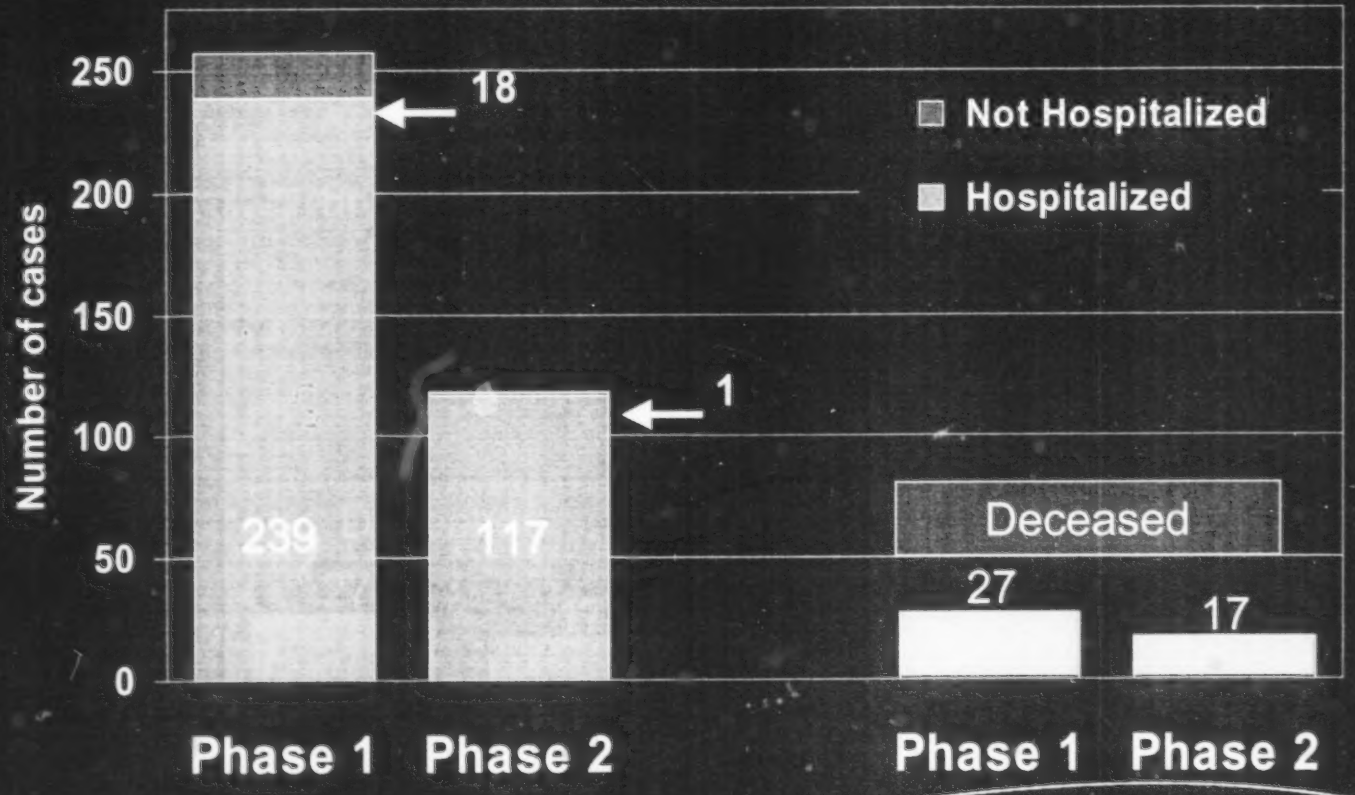
Hospitalization and Case Fatality Data

Probable and Suspect SARS Cases



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Case Fatality by Age Groups

at the end of Phase 2, Probable SARS Cases

Age Group [Years]	Phase 1		Phase 2		Phase 1 & 2	
	N	%	N	%	N	%
< 18	0	0	0	0	0	0
18 – 35	0	0	0	0	0	0
36 – 64	10	38	6	31	16	37
65 +	16	62	11	69	27	63
Total	26	100	17	100	43	100

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Case Fatality by Contact Sub-Groups
at the end of Phase 2, Probable SARS Cases

	Phase 1		Phase 2	
Case Fatality Rate →	19.1%		15.3%	
↓ Contact Type	Deaths	%	Deaths	%
Healthcare Setting: Patient	12	46	13	76
Visitor	2	8	3	18
Worker	2	8	1	6
Household	8	31	0	0
Community Setting	1	4	0	0
Travel	1	4	0	0
Total	26	100	17	100

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Comparative Case Fatality Rates

Probable SARS Cases (as at July 11/03)

Country/Province	Cases [A]	Deaths [B]	Case Fatality Rate[1]
Ontario – Phase 1	136	25	18.4%
Phase 2	111	16	14.4%
China [2]	5,327	348	6.5%
Hong Kong [2]	1,755	298	17.0%
Taiwan [2]	671	84	12.5%
Singapore [2]	206	32	15.5%
United States [2]	75	0	0%

[1] [B] divided by [A] [2] Source: WHO (Jul. 11/03)

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Initial Actions

Feb. 19

- Ministry alerts healthcare providers
- Index hospital closed
- SARS becomes reportable disease
- Quarantine measures instituted
- Provincial emergency declared
- Directives for contact, droplet, airborne precautions instituted provincially

March 28

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Response by the Ontario Government

- Provincial Operations Committee
- Provincial directives to hospitals and health units
- Coordination of resources
- Daily media conferences and reports

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Outbreak Management by Public Health Division

- Set up SARS teams
- Conferences to discuss cases
- Routine dissemination of information (daily reports)
- Developed policies & directives through Science Committee
- Dedicated space, staff, communication lines
- Hired / seconded / borrowed staff on short-term contracts

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Infection Control in Hospitals

- Enhanced infection control measures throughout the hospitals
- Creation of contained SARS wards
- New directives for patient transfers and visitors
- Work quarantine for selected healthcare staff
- Limiting the number of healthcare settings in which staff can work
- Curtailing other health services

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Enhanced Infection Control Measures in Hospitals

- Wearing of personal protective equipment

  (masks, gowns, eye-gear, gloves)
- Screening patients at all points of entry
  - Temperature check on arrival
  - Completion of form indicating symptom and travel information
  - Outpatients positioned more than one metre (3 feet) apart
- Phone-screening for outpatients prior to appointment
- Banning all **visitors** (except on compassionate grounds)

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Infection Control Guidelines

- **Airborne Precautions**
  - N95 respirator or equivalent
  - Negative pressure isolation rooms where available
  - Hand-washing
- **Droplet and Contact Precautions**
  - Gloves, gowns, eye protection (i.e., goggles, face shield)
  - Hand-washing
- **Minimize number of people in room during high risk procedures**

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Planning for the Future

- Ongoing epidemiology centre, heightened surveillance
- Epi Investigation and PH Policy capacity
- Ongoing Public Health Call Centre with 24/7 coverage
- Mobile Response Teams to assist Health Units in time of outbreaks
- Additional Public Health field staff
- Strengthened laboratory capacity
- Public education

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Fever and Respiratory Illness (FRI) Surveillance

- active surveillance, builds on current ER & admission assessment
- Looks for febrile respiratory illness, esp. pneumonia
- has not been issued
- supports current IC practices
- all acute care hospitals in Ontario
  - but pediatric and cancer facilities/units
- objectives
  - maintain high level of vigilance
  - establish baseline
  - early identification of
  - early warning system

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FRI - Criteria for Success

- Cases of FRI are managed with respiratory and contact precautions
- potential SARS cases detected on admission
- audit and compliance indicators met
- reporting requirements are met
- no SARS exposure or transmission
- FRI rates established
- early detection of and successful rapid intervention for other respiratory infection outbreaks

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